

The listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Canceled)
2. (Previously Presented) A method according to claim 3, further comprising:
forming a blocking film between the substrate and the semiconductor island,
wherein the substrate is a glass substrate;
wherein the blocking film includes,
a silicon nitride film with a thickness in a range of 5-200 nm formed on the glass substrate, and
a silicon oxide film with a thickness in a range of 20-1000 nm formed on the silicon nitride film.
3. (Previously Presented) A method of manufacturing a semiconductor device:
the semiconductor device comprising: at least two p-channel thin film transistors in a pixel portion,
each of the two p-channel thin film transistors in the pixel portion fabricated through the method comprising:
forming a semiconductor island over a substrate;
forming a gate electrode adjacent to the semiconductor island with a gate insulating film therebetween;
forming a source region, a drain region and a channel region formed between the source and drain regions,
wherein the two p-channel thin film transistors are connected in series,
wherein an off current from each of the p-channel thin film transistors is less than 10^{-12} A where a voltage of the drain region is 1V, and
wherein a pixel electrode is connected to a data line without any n-channel thin film transistor connected therebetween.

4. (Previously Presented) A method according to claim 3, further comprising:
forming an interlayer insulating film including boro-phosphosilicate glass over the two p-channel thin film transistors.

5. (Previously Presented) A method according to claim 3, wherein the semiconductor island is a crystalline semiconductor island.

6. (Previously Presented) A method according to claim 3, wherein each of the source and drain regions comprises boron.

7. (Canceled)

8. (Previously Presented) A method according to claim 9 further comprising:
forming a blocking film between the substrate and the semiconductor island,
wherein the substrate is a glass substrate;
wherein the blocking film includes,
a silicon nitride film with a thickness in a range of 5-200 nm formed on the glass substrate, and
a silicon oxide film with a thickness in a range of 20-1000 nm formed on the silicon nitride film.

9. (Previously Presented) A method of manufacturing a display device, said display device comprising:
a pixel portion and a driving circuit portion;
at least two p-channel thin film transistors being formed in the pixel portion;
each of the two p-channel thin film transistors fabricated through the method comprising:
forming a semiconductor island over a substrate;
forming a gate electrode adjacent to the semiconductor island with a gate insulating film therebetween;
forming a source region, a drain region and a channel region formed between the source and drain regions,

wherein the two p-channel thin film transistors are connected in series,
wherein an off current from each of the p-channel thin film transistors is less than 10^{-12} A where a voltage of the drain region is 1V, and
wherein a pixel electrode is connected to a data line without any n-channel thin film transistor connected therebetween.

10. (Previously Presented) A method according to claim 9, further comprising:
forming an interlayer insulating film including boro-phosphosilicate glass over the two p-channel thin film transistors.

11. (Previously Presented) A method according to claim 9, wherein the semiconductor island is a crystalline semiconductor island.

12. (Previously Presented) A device according to claim 9, wherein each of the source and drain regions comprises boron.

13. (Canceled)

14. (Previously Presented) A method according to claim 15 further comprising:
forming a blocking film between the substrate and the semiconductor island,
wherein the substrate is a glass substrate,
wherein the blocking film includes,
a silicon nitride film with a thickness in a range of 5-200 nm formed on the glass substrate, and
a silicon oxide film with a thickness in a range of 20-1000 nm formed on the silicon nitride film.

15. (Previously Presented) A method of manufacturing a semiconductor device, said semiconductor device comprising:
at least a first p-channel thin film transistor and a second p-channel thin film transistor in a pixel portion;

a transmission gate including a CMOS circuit, said CMOS circuit including at least an n-channel thin film transistor and a third p-channel thin film transistor;

each of the first, second and third p-channel thin film transistors fabricated through the method comprising:

forming a semiconductor island over a substrate;

forming a gate electrode adjacent to the semiconductor island with a gate insulating film therebetween;

forming a source region, a drain region and a channel region formed between the source and drain regions,

wherein the first and second p-channel thin film transistors are connected in series,

wherein an off current from each of the first, second and third p-channel thin film transistors is less than 10^{-12} A where a voltage of the drain region is 1V, and

wherein a pixel electrode is connected to a data line without any n-channel thin film transistor connected therebetween.

16. (Previously Presented) A method according to claim 15 further comprising:

forming an interlayer insulating film including boro-phosphosilicate glass over the first, second and third p-channel thin film transistors and the n-channel thin film transistor.

17. (Previously Presented) A method according to claim 15, wherein the semiconductor island is a crystalline semiconductor island.

18. (Previously Presented) A method according to claim 15, wherein each of the source and drain regions of each of the first, second and third p-channel thin film transistors comprises boron.

19. (Previously Presented) A method according to claim 15, wherein each of the second source and drain regions of the n-channel thin film transistor comprises phosphorus.

20. (Previously Presented) A method of manufacturing a semiconductor device comprising at least two p-channel thin film transistors,

each of the two p-channel thin film transistors fabricated through the method comprising:

forming an amorphous semiconductor film on an insulating surface over a substrate;

crystallizing the amorphous semiconductor film to form a crystalline semiconductor film;

patterning the crystalline semiconductor film to form a crystalline semiconductor island;

forming a gate electrode adjacent to the crystalline semiconductor island with a gate insulating film therebetween;

introducing a p-type impurity to form a source region, a drain region and a channel region formed between the source and drain regions,

wherein the two p-channel thin film transistors are connected in series,

wherein an off current from each of the p-channel thin film transistors is less than 10^{-12} A where a voltage of the drain region is 1V.

21. (Previously Presented) A method according to claim 20, further comprising:
forming a blocking film between the substrate and the crystalline semiconductor island,

wherein the substrate is a glass substrate;

wherein the blocking film includes,

a silicon nitride film with a thickness in a range of 5-200 nm formed on the glass substrate, and

a silicon oxide film with a thickness in a range of 20-1000 nm formed on the silicon nitride film.

22. (Previously Presented) A method according to claim 20, further comprising:
forming an interlayer insulating film including boro-phosphosilicate glass over the two p-channel thin film transistors.

23. (Previously Presented) A method according to claim 20, wherein each of the source and drain regions comprises boron.

24. (Previously Presented) A method according to claim 20, wherein the amorphous semiconductor film is crystallized by thermally annealing.

25. (Previously Presented) A method of manufacturing a semiconductor device comprising at least two p-channel thin film transistors,

each of the two p-channel thin film transistors fabricated through the method comprising:

forming an amorphous semiconductor film on an insulating surface over a substrate;

annealing the amorphous semiconductor film with a laser light to crystallize the amorphous semiconductor film;

patterning the crystallized semiconductor film to form a crystalline semiconductor island;

forming a gate electrode adjacent to the crystalline semiconductor island with a gate insulating film therebetween;

introducing a p-type impurity to form a source region, a drain region and a channel region formed between the source and drain regions,

wherein the two p-channel thin film transistors are connected in series,

wherein an off current from each of the p-channel thin film transistors is less than 10^{-12} A where a voltage of the drain region is 1V.

26. (Previously Presented) A method according to claim 25, further comprising:
forming a blocking film between the substrate and the crystalline semiconductor island,

wherein the substrate is a glass substrate;

wherein the blocking film includes,

a silicon nitride film with a thickness in a range of 5-200 nm formed on the glass substrate, and

a silicon oxide film with a thickness in a range of 20-1000 nm formed on the silicon nitride film.

27. (Previously Presented) A method according to claim 25, further comprising:
forming an interlayer insulating film including boro-phosphosilicate glass over the two p-channel thin film transistors.

28. (Previously Presented) A method according to claim 25, wherein each of the source and drain regions comprises boron.

29. (Previously Presented) A method of manufacturing a semiconductor device comprising a plurality of p-channel thin film transistors,

each of the plurality of the p-channel thin film transistors fabricated through the method comprising:

forming a semiconductor island over a substrate;

forming a gate electrode adjacent to the semiconductor island with a gate insulating film therebetween;

forming a source region, a drain region and a channel region formed between the source and drain regions,

wherein the plurality of p-channel thin film transistors are connected in series,

wherein an off current from each of plurality of the p-channel thin film transistors is less than 10^{-12} A where a voltage of the drain region is 1V.

30. (Previously Presented) A method according to claim 29, further comprising:

forming a blocking film between the substrate and the semiconductor island,

wherein the substrate is a glass substrate;

wherein the blocking film includes,

a silicon nitride film with a thickness in a range of 5-200 nm formed on the glass substrate, and

a silicon oxide film with a thickness in a range of 20-1000 nm formed on the silicon nitride film.

31. (Previously Presented) A method according to claim 29, further comprising:
forming an interlayer insulating film including boro-phosphosilicate glass over the two p-channel thin film transistors.

32. (Previously Presented) A method according to claim 29, wherein the semiconductor island is a crystalline semiconductor island.

33. (Previously Presented) A method according to claim 29, wherein each of the source and drain regions comprises boron.

34. (Previously Presented) A method according to claim 29, wherein the semiconductor device includes at least three p-channel thin film transistors connected in series.

35. (Previously Presented) A method of manufacturing a display device,
said display device comprising:
a pixel portion;
a drive circuit portion;
at least a first p-channel thin film transistor and a second p-channel thin film transistor in the pixel portion;
a transmission gate including a CMOS circuit in the drive circuit portion, said CMOS circuit including at least an n-channel thin film transistor and a third p-channel thin film transistor;
each of the first, second and third p-channel thin film transistors fabricated through the method comprising:
forming a semiconductor island over a substrate;
forming a gate electrode adjacent to the semiconductor island with a gate insulating film therebetween;
forming a source region, a drain region and a channel region formed between the source and drain regions,
wherein the first and second p-channel thin film transistors are connected in series,

wherein an off current from each of the first, second and third p-channel thin film transistors is less than 10^{-12} A where a voltage of the drain region is 1V,

wherein only p-channel thin film transistors connected in series are used as a switching element in the pixel portion.

36. (Previously Presented) A method according to claim 35 further comprising:
forming an interlayer insulating film including boro-phosphosilicate glass over the first, second and third p-channel thin film transistors and the n-channel thin film transistor.

37. (Previously Presented) A method according to claim 35, wherein the semiconductor island is a crystalline semiconductor island.

38. (Previously Presented) A method according to claim 35, wherein each of the source and drain regions of each of the first, second and third p-channel thin film transistors comprises boron.

39. (Previously Presented) A method according to claim 35, wherein each of the second source and drain regions of the n-channel thin film transistor comprises phosphorus.

40. (Previously Presented) A method of manufacturing a semiconductor device comprising:

forming a semiconductor film comprising amorphous silicon on an insulating surface;

heating the semiconductor film to crystallize said semiconductor film at least partly;

patterning the crystallized semiconductor film into at least first and second semiconductor islands;

forming a gate insulating film on the first and second semiconductor islands;

forming source and drain regions having a p-type conductivity in the first and second semiconductor islands wherein a channel region is formed between the source and drain regions in the first and second semiconductor islands;

forming at least first and second p-channel thin film transistors wherein said first and second p-channel thin film transistors using said first and second semiconductor islands as active layers thereof;

wherein each of the first and second semiconductor islands has a first portion which includes said channel region and has a crystalline structure and a second portion having an amorphous structure below the first portion.

41. (Withdrawn) A method according to claim 39 wherein the first and second p-channel thin film transistors are connected to a pixel electrode in series.

42. (Withdrawn) A method according to claim 39 wherein an off current of each of the first and second p-channel thin film transistors is 10^{-12} A when a voltage of the drain region is 1V.

43. (New) A method of manufacturing a semiconductor device comprising:
the semiconductor device comprising at least two p-channel thin film transistors in a pixel portion,

each of the two p-channel thin film transistors fabricated through the method comprising:

forming an amorphous semiconductor film on an insulating surface over a substrate;

crystallizing the amorphous semiconductor film to form a crystalline semiconductor film;

patterning the crystalline semiconductor film to form a crystalline semiconductor island;

forming a gate electrode adjacent to the crystalline semiconductor island with a gate insulating film therebetween;

introducing a p-type impurity to form a source region, a drain region and a channel region formed between the source and drain regions,

wherein the two p-channel thin film transistors are connected in series,
wherein an off current from each of the p-channel thin film transistors is less than 10^{-12} A where a voltage of the drain region is 1V, and
wherein a pixel electrode is connected to a data line without any n-channel thin film transistor connected therebetween.

44. (New) A method according to claim 43, further comprising:
forming a blocking film between the substrate and the crystalline semiconductor island,
wherein the substrate is a glass substrate;
wherein the blocking film includes,
a silicon nitride film with a thickness in a range of 5-200 nm formed on the glass substrate, and
a silicon oxide film with a thickness in a range of 20-1000 nm formed on the silicon nitride film.

45. (New) A method according to claim 43, further comprising:
forming an interlayer insulating film including boro-phosphosilicate glass over the two p-channel thin film transistors.

46. (New) A method according to claim 43, wherein each of the source and drain regions comprises boron.

47. (New) A method according to claim 43, wherein the amorphous semiconductor film is crystallized by thermally annealing.

48. (New) A method of manufacturing a semiconductor device comprising:
the semiconductor device comprising at least two p-channel thin film transistors in a pixel portion,
each of the two p-channel thin film transistors fabricated through the method comprising:

forming an amorphous semiconductor film on an insulating surface over a substrate;

annealing the amorphous semiconductor film with a laser light to crystallize the amorphous semiconductor film;

patterning the crystallized semiconductor film to form a crystalline semiconductor island;

forming a gate electrode adjacent to the crystalline semiconductor island with a gate insulating film therebetween;

introducing a p-type impurity to form a source region, a drain region and a channel region formed between the source and drain regions,

wherein the two p-channel thin film transistors are connected in series,

wherein an off current from each of the p-channel thin film transistors is less than 10^{-12} A where a voltage of the drain region is 1V, and

wherein a pixel electrode is connected to a data line without any n-channel thin film transistor connected therebetween.

49. (New) A method according to claim 48, further comprising:

forming a blocking film between the substrate and the crystalline semiconductor island,

wherein the substrate is a glass substrate;

wherein the blocking film includes,

a silicon nitride film with a thickness in a range of 5-200 nm formed on the glass substrate, and

a silicon oxide film with a thickness in a range of 20-1000 nm formed on the silicon nitride film.

50. (New) A method according to claim 48, further comprising:

forming an interlayer insulating film including boro-phosphosilicate glass over the two p-channel thin film transistors.

51. (New) A method according to claim 48, wherein each of the source and drain regions comprises boron.

52. (New) A method of manufacturing a semiconductor device comprising:
the semiconductor device comprising a plurality of p-channel thin film transistors
in a pixel portion,
each of the plurality of the p-channel thin film transistors fabricated through the
method comprising:
forming a semiconductor island over a substrate;
forming a gate electrode adjacent to the semiconductor island with a gate
insulating film therebetween;
forming a source region, a drain region and a channel region formed between the
source and drain regions,
wherein the plurality of p-channel thin film transistors are connected in series,
wherein an off current from each of plurality of the p-channel thin film transistors
is less than 10^{-12} A where a voltage of the drain region is 1V, and
wherein a pixel electrode is connected to a data line without any n-channel thin
film transistor connected therebetween.

53. (New) A method according to claim 52, further comprising:
forming a blocking film between the substrate and the semiconductor island,
wherein the substrate is a glass substrate;
wherein the blocking film includes,
a silicon nitride film with a thickness in a range of 5-200 nm formed on the glass
substrate, and
a silicon oxide film with a thickness in a range of 20-1000 nm formed on the
silicon nitride film.

54. (New) A method according to claim 52, further comprising:
forming an interlayer insulating film including boro-phosphosilicate glass over the
two p-channel thin film transistors.

55. (New) A method according to claim 52, wherein the semiconductor island is
a crystalline semiconductor island.

56. (New) A method according to claim 52, wherein each of the source and drain regions comprises boron.

57. (New) A method according to claim 52, wherein the semiconductor device includes at least three p-channel thin film transistors connected in series.

58. (New) A method of manufacturing a display device,
said display device comprising:
a pixel portion;
a drive circuit portion;
at least a first p-channel thin film transistor and a second p-channel thin film transistor in the pixel portion;
a transmission gate including a CMOS circuit in the drive circuit portion, said CMOS circuit including at least an n-channel thin film transistor and a third p-channel thin film transistor;
each of the first, second and third p-channel thin film transistors fabricated through the method comprising:
forming a semiconductor island over a substrate;
forming a gate electrode adjacent to the semiconductor island with a gate insulating film therebetween;
forming a source region, a drain region and a channel region formed between the source and drain regions,
wherein the first and second p-channel thin film transistors are connected in series,
wherein an off current from each of the first, second and third p-channel thin film transistors is less than 10^{-12} A where a voltage of the drain region is 1V,
wherein only p-channel thin film transistors connected in series are used as a switching element in the pixel portion, and
wherein the pixel portion does not include any n-channel thin film transistor.

59. (New) A method according to claim 58 further comprising:

forming an interlayer insulating film including boro-phosphosilicate glass over the first, second and third p-channel thin film transistors and the n-channel thin film transistor.

60. (New) A method according to claim 58, wherein the semiconductor island is a crystalline semiconductor island.

61. (New) A method according to claim 58, wherein each of the source and drain regions of each of the first, second and third p-channel thin film transistors comprises boron.

62. (New) A method according to claim 58, wherein each of the second source and drain regions of the n-channel thin film transistor comprises phosphorus.